

September 9, 1998

This document was submitted to EPA by a registrant in connection with EPA's evaluation of this chemical and it is presented here exactly as submitted.

18/OPP#34134

MILES 

Agriculture Division

October 6, 1994

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ATTN: Irwin Hornstein
Special Review and Reregistration Division, H7508W

Subject: Reregistration of NEMACUR (Fenamiphos)
Chemical No. 100601
Refinement for Tobacco Aquatic Exposure Assessment

Dear Mr. Hornstein:

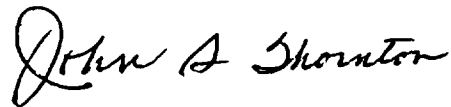
With the Agency's September 14, 1994 letter, Miles received the EEB Science Chapter for the Fenamiphos RED which included an aquatic exposure assessment for the use of fenamiphos on tobacco.

For a Tier I exposure assessment, the assumptions and calculations used by EPA were appropriate. However, Tier I assessments are by definition preliminary, worst case assessments. Since the tobacco use pattern is unique and Miles believes the characteristics which make it unique also translate into considerably lower exposure potential than indicated by the Tier I assessment, Miles initiated a pilot program in 1991 to attempt to better quantify aquatic exposure potential from tobacco fields. This information is briefly described in the attached "Refinement for Tobacco Aquatic Exposure Assessment" and is presented in detail in Miles Report Number 106799 which will follow.

We ask that the Agency review this information before the RED is issued.

Yours very truly,

MILES INC.
AGRICULTURE DIVISION



John S. Thornton
Manager, Registrations

JST:MKT:brh

Enclosure: "Refinement for Tobacco Aquatic Exposure Assessment," dated
October 3, 1994

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October 3, 1994

Refinement for Tobacco Aquatic Exposure Assessment

EPA/EEB has provided an aquatic exposure assessment for the use of fenamiphos on tobacco (April 25 1994; EEB Science Chapter). Their evaluation indicated that, based on assumptions regarding incorporation and percent runoff, the potential instantaneous exposure levels range from a low of 14.6 ppb to a high of 560 ppb. (NOTE: EPA's exposure estimate was based on a maximum application rate of 20 lb ai/A; whereas the actual maximum rate for tobacco is 6 lb ai/A. Adjusting for this difference in application rate, EPA's EEC for Tobacco would range from 4.4 to 168 ppb.) For a Tier I exposure assessment, the assumptions and calculations used by EPA were appropriate. However, Tier I assessments are by definition preliminary, worst case assessments. The tobacco use pattern is unique and Miles believes the characteristics which make it unique also translate into considerably lower exposure potential than indicated by the Tier I assessment. With this in mind, Miles initiated a pilot program in 1991 to attempt to better quantify aquatic exposure potential from tobacco fields. This information is briefly described below and is presented in more detail in Miles Report Number 106799 (Nemacur 3 Use on Tobacco: Incorporation of Remote Sensing / GIS Evaluation into an Aquatic Exposure Assessment; by J. C. Lin). We would request that the information outlined below be considered in a refined exposure assessment for Tobacco.

Miles is willing to meet directly with the Agency to discuss this risk assessment. If you have any questions concerning this assessment, please feel free to contact R. L. Graney directly (913-897-9132).

Refined Exposure Assessment

Miles applied EPA's standard aquatic modeling scenario to tobacco and used the PIRANHA modeling package to estimate potential exposure levels. This standard scenario assumes all tobacco fields are directly adjacent to aquatic habitats and that there is a 10:1 land to water ratio. The results of this modeling effort (discussed in greater detail by Lin, 1994; Miles Report Number 106799), expressed as the Probability of Exceedence, were as follows:

Exceedence Probability (%)	Return Period (year)	Instantaneous (t=0) EEC (ppb)	Acute (96 hour) EEC (ppb)	Chronic (21 day) EEC (ppb)
5	20	18.1	16.6	12.1
10	10	11.6	10.7	8.1
20	5	10.1	9.4	7.1

2

Currently EPA is using a 10% Probability of Exceedence in refined risk assessments. Based on this, and using the worst case instantaneous value, an EEC of 11.6 ppb is obtained. This exposure estimate is on the low end relative to the EPA's Tier I assessment; however it still exceeds the Levels of Concern for aquatic organisms.

The exposure assessment presented above was further refined by considering the actual size of tobacco fields relative to water bodies. Tobacco production is tightly regulated on an allocation based system and thus field scale production is much smaller than in other crops. This fact is generally known; however quantitative data which can be directly input into an exposure assessment was not available. With this in mind, Miles initiated a study which used satellite imagery to quantitate the following:

1. What is the actual ratio of tobacco field size to surface water?
2. What is the typical size "buffer area" between tobacco fields and aquatic habitats?

The study used Landsat Thematic Mapper subscenes for the evaluation. The entire subscene covered over 1.5 million acres, although the majority of the spatial analysis was conducted only for Wayne county, North Carolina (approx. 350,000 acres). The area was chosen because it represents greatest tobacco acreage and Namacur usage. The ArcInfo Geographic Information System (GIS) was used to integrate the land use information and address the specific questions outlined above. Details of the remote sensing and GIS data evaluation can be found in Lin, 1994 (MRN 106799).

The results of the tobacco acreage evaluation confirm that tobacco fields are in fact very small. Over 75% of all tobacco fields are less than 10 acres in size. Using the acreage of tobacco fields located within a given distance of lentic bodies of water, an average land to water ratio of 0.08:1 was calculated. This can be interpreted to mean that, on average, the tobacco acreage located adjacent to lentic water bodies is only 0.08% of the surface area of the water (not the 10:1 ratio assume in the standard scenario). In addition, it was found that the majority of the tobacco fields are not adjacent to aquatic habitats. Less than 5 acres of tobacco (<0.2% of all tobacco) were identified to be within 100 feet of lentic water bodies and less than 165 acres (<0.4%) within 500 feet of water.

The land:water ratio information can be used to adjust the EEC's calculated using the PIRANHA modeling system. Using only the 10% Probability of Exceedence values, the new EEC's can be adjusted using 0.08:1 ratio (i.e., $(0.08 \times 11.6) / 10 = 0.093$):

Exceedence Probability (%)	Return Period (year)	Instantaneous (t=0) EEC (ppb)	Chronic (21 day) EEC (ppb)
10	10	0.093	0.065

Based on these new EEC estimates, the Levels of Concern for the most sensitive species are not exceeded. Specifically:

ACUTE

Aquatic Species	LC50 (ppb)	EEC (ppb)	Risk Quotient
Bluegill	9.6 ppb	0.093	0.01
Daphnia	1.9 ppb	0.093	0.05

CHRONIC

Aquatic Species	Chronic NOEC (ppb)	EEC (ppb)	Risk Quotient
Rainbow Trout Early Life Stage	3.8	0.065	0.02
Daphnia Life Cycle	0.17	0.065	0.38

It is also important to remember that the EEC's calculated assumed the tobacco fields were directly adjacent to aquatic habitats. As shown via remote sensing, the majority of tobacco fields have a considerable buffer between the field and the water body. This should provide further comfort that there is minimal potential for adverse effects.

The above discussed remote sensing project was a pilot project conducted on a limited area. Regardless, it is believed that the tobacco field size information is applicable to all tobacco production and that, in general, the results can be extrapolated to other areas.

R. L. Graney
10/3/94